

## Effect of Psychological Intervention on Stress coping Mechanisms and Burnout Syndrome among Critical care Nurses

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### Abstract:

Critical care nurses are more liable for the occurrence of burnout, stress and inappropriate use of stress coping mechanisms. Burnout is caused by the negative effects of job stress. Because of burnout nurses may become less productive, or absent due to illness, as well as the fluctuation of staff increases. **So**, A quasi-experimental research design with one group pre/post-test approach was used to assess the effect of psychological educational programs on Stress Coping Mechanisms and Burnout syndrome among Critical care Nurses. **Setting:** General, trauma, pediatric, internal medicine and open heart surgery intensive care units at Sohag University Hospital. **Sample:** A convenient sample of all nurses working in the selected setting and who is in the actual work force during the study time. **Tools:** Online questionnaire covers three tools as follows **Tool I:** Burnout self-assessment questionnaire **Tool II:** The Perceived Stress Scale-10 and **Tool III:** The Brief COPE Inventory. **Results:** shows statistically significant improvements in parameters for Maslach Burnout Inventory as Mean±SD for Emotional Exhaustion was (32.29±11.36 pre-program versus 23.69±14.72 post-program), Depersonalization (12.73±6.19 pre-program versus 10.61±6.51 post-program) and Personal accomplishment (37.35±9.53pre-program versus 43.37±5.48post-program). **Conclusion:** application of a psychological programs has a positive effect on reducing the level of burnout, and stress among critical care nurses. **Recommendations:** Training programs about burnout syndrome and Stress management techniques should be held periodically for critical care nurses.

**Keywords:** *Burnout, Critical care nurses & Stress.*

### Introduction

Nursing is, by its nature, an occupation with a higher degree of stress. Mitigating stress has become a major concern in many fields, especially in management, due to low productivity and poor staff morale as problems related to stress. Research has reported that there is a higher prevalence of suicide and psychiatry outpatient referrals for nurses among professional groups. It is also considered a profession in which there are higher dropout rates during the training period(Chaudhari et al., 2018).

Critical Care Nurses play an important role as members of professional teams in Intensive care Units (ICUs), because the care they offer is more sophisticated than that provided elsewhere in the hospital. ICU nurses must respond to major requests regularly to fulfill the many duties that have been allocated to them. They serve as caregivers, health educators, researchers, and unit managers in intensive care units (Alzailai, et al, 2021).

Meeting the basic needs of the patient and carrying out therapeutic interventions are the fundamental jobs of nurses. Specific patient-care situations are found

to be associated with stress for nurses. Dealing with death and dying, uncertainty regarding patient treatment, workload and inadequate preparation to deal with patient's emotional issues have been identified as the common causes of stress (Chatzigianni et al., 2018). Within the patient–nurse relationship, patients' poor attitudes toward treatment and care and/or unreasonable demands from patients and their families also contribute to workplace stress in nurses(Sarafis et al., 2016).

Working in an environment that needs such complicated multitasking, as well as a tremendous workload as well as the necessity of providing specialized care for critically ill and dependent patients, can be overwhelming for nurses. As a result of the high degree of stress involved, occupational burnout may occur, leading to low job contentment and significant turnover (Alharbi., et al, 2019). In addition, during the recent pandemic of novel coronavirus disease (COVID-19), nurses were under a lot of stress caring for infected patients while also being at risk of getting infected themselves. (Alzailai., et al, 2021)

Burnout has been defined by the World Health Organization as a syndrome caused by extended exposure to professional stress that has not been effectively handled. (World Health Organization, 2019). Burnout is a type of occupational stress that occurs as a result of long-term exposure to stress, and is particularly linked to psychosocial factors at work. (Alharbi., et al, 2019)

Clinical symptoms of Burnout syndrome are nonspecific and include tiredness, headaches, eating problems, insomnia, irritability, emotional instability, and rigidity in relationships with other people. In comparison to nurses working in other units, ICU nurses are at a higher risk of work-related stress and are less satisfied with their professions (Awajeh., et al, 2018).

Critical care nurses are considered one of the most likely to report high levels of occupation stress. ICU nurse burnout is linked to a high rate of bed closures due to direct nursing care duties and a shortage of nursing staff. Many contributing factors have been identified as a leading cause of stress in the ICUs including high patient mortality rate, the nature of death in these settings, young people dying in an ICU area are liable to staff turnover and Shortages, and yet some nurses are succeeding in the ICU environment and maintain their enthusiasm for their work even with the stresses, On the other side, others become severely distressed, resulting in high sickness, absence, and poor staff retention (Awajeh., et al, 2018). Controlling the working environment and getting enough sleep are critical and protective elements in dealing with workplace stress (Andolhe., et al 2015).

Stress is described as any discomfort experienced by an individual as a result of activities that are thought to be excessively intense and frequent, and that overwhelm a person's coping abilities and resources to cope. The ability to recognize and adjust to stress relies on the individual's ability to identify and use coping methods. (Vinothkumar et al., 2016).

Job stress among nurses could be affected by their role in the health care facility and their gender. Clinical sources of stress include working with dying patients, interpersonal conflict with other nurses, insecurity about clinical competence and fear of failure, interpersonal relations with patients, work overload and nursing care given to the patient (Mohamed & Abd El-Hafez., 2015).

Coping has been viewed as a stabilizing factor that may assist individuals in maintaining psychosocial adaptation during stressful events. The process of coping is a very complex response that occurs when an individual attempts to remove stress or a perceived threat from the environment. Thus, the actual reaction to an environmental event may be as important as the

event itself. The Effectiveness of coping behaviors depends on the situation in which they are used. Some coping behaviors may work well for some situations but not for others. In general terms, coping is a strategy that helps people reduce stress and solve problems. (Folkman et al 1986) define coping as "the person's cognitive and behavioral efforts to manage the internal and external demands in the person-environment transaction (Muhawish., et al, 2019).

### Significance of the study:

Nurses working in a critical care setting, such as an intensive care unit (ICU), face a difficult daily work schedule, high morbidity and death rates, traumatic scenarios, and ongoing ethical concerns. When these stressors are combined with inadequate staffing, a lack of resources, and an inability to cope, it's easy to see why critical care personnel have one of the highest incidence of Burnout Syndrome (BOS). Nurses, patients, and the hospital all suffer from burnout syndrome. It can lead to PTSD, depression, suicide ideation, lower staff retention, morale, patient care quality, and patient satisfaction. (Moss, et al 2016). In a major French survey study, 81 percent of critical care nurses reported one or more burnout symptoms, with severe burnout syndrome detected in 33 percent of critical care nurses and nursing assistants. (Kerlin, et al. 2020).

As a result, training nurses effective coping skills to increase resiliency and well-being could be very beneficial in treating and avoiding burnout.

### Aim of the study:

Evaluate the effect of psychological intervention on Stress Coping Mechanisms and Burnout syndrome among Critical care Nurses. Which can achieved through the following specific aims:

- Determine the level of burnout among ICU nurses both before and after the educational program is implemented.
- Determine whether teaching nurses healthy stress coping methods will help them avoid or reduce burnout.

### Material and Methods:

#### Research design:

A quasi-experimental research design with one group pre/post-test approach was used to assess the effect of psychological educational programs on Stress Coping Mechanisms and Burnout syndrome among Critical care Nurses. Thus only one group is observed twice (before and after introducing the program).

#### Research hypothesis:

**Hypothesis (1):** Level of burnout among critical care nurses after psychological educational program expected to be reducer than before.

**Hypothesis (2):** Perceived stress level among critical care nurses after psychological educational program expected to be reducer than before.

**Study variables:**

- The independent variable was the psychological educational program.
- The dependent variables were critical care nurse coping mechanism and burnout syndrome.

**Setting:**

The study was carried out in general, trauma, pediatric, internal medicine and open heart surgery intensive care units at Sohag University Hospital.

**Sample:**

A convenient sample of all nurses working in the selected setting and who is in the actual work force during the study time (about 51 nurses) were included in the study.

**Inclusion criteria:**

- 1- Critical care nurses who are on the job in the Intensive care units at the time of the study.
- 2- Critical care nurses who are willing to participate in the study.

**Exclusion criteria**

1. Nurses who are not willing to participate in the study
2. Nurses who were not present (On vacation) at the time of data collection
3. Nurses with less than one year of experience in the intensive care unit.
4. Nurses who are absent for more than one session from the training sessions.

**Study Tools:**

Three main tools were used to collect data in the current study after reviewing the related and current literature as follows:

**Tool I: Burnout self assessment questionnaire:**

This questionnaire was developed by the researchers based on the review of the related literature (Maslach, & Jackson, 1978 & Maslach, et al, 1996) to assess burnout levels among participants. It consisted of two parts.

**Part I: Demographic and work-related data:**

Demographic data include nurse (code, age, marital status and education Levels) and work-related data includes (Type of ICU, and experience years).

**Part II: Maslach Burnout Inventory questionnaire:**

Maslach Burnout Inventory scale (MBI) developed by Maslach, & Jackson, 1978) for detecting and measuring the severity of burnout syndrome BOS. (It consists of 22 questions which are divided into the three subscales of the burnout syndrome which are Emotional Exhaustion (9 questions), Depersonalization (5 questions) and individual performance (8 questions). The Emotional Exhaustion subscale was divided into items that assessed feelings

of being emotionally overextended and exhausted by one's work. The Depersonalization subscale consisted of items that measured an unfeeling and impersonal response towards ICU service recipients. Personal Accomplishment had items that assessed feelings of competence achievement of one's work by ICU nurses. For emotional exhaustion and depersonalization, higher scores were equivalent to higher degrees of experienced burnout by ICU nurses. Contrary to the two, in the Personal Accomplishment subscale, lower scores by ICU nurses paralleled higher degrees of experienced burnout. The three subscales were scored separately in this study. To assess the levels of burnout of the participants, the scoring of questions surveyed adopted a Likert Scale from 0 to 6: (0) represented "never", (1) represented "a few times per year", (2) represented "once a year", (3) represented "a few times a month", (4) represented "once a week", (5) represented "a few times per week" and (6) represented "everyday". In order to determine the total burnout score, questions 1, 2, 3, 5, 6, 9, 10, 12, 13, 14, 15, 19, 21 and 22 are considered (+) and questions 4, 7, 8, 11, 16, 17, 18 and 20 (-), and then aggregated. Results for burnout frequency will be 35 to 84 (high), -15 to 34 (average), -16 to -66 (low) and for burnout severity 40 to 98 (high), -18 to 39 (average) and -19 to -77 (low). The validity of the questionnaire was verified by Maslach and Jackson and its reliability was calculated through Cronbach's alpha, which was reported between -0.60 and 0.08. In Sedghi's research, the reliability was determined to be 0.78.20 The Cronbach's alpha was reported as 0.8 in the present study.

**Tool II: The Perceived Stress Scale-10 (PSS- 10):**

The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes several direct questions about current levels of experienced stress. The questions in the PSS ask about feelings and thoughts during the last month. Each respondent is asked how often they felt a certain way (Chaaya et al, 2010 & Cohen, et al, 1983). The PSS scale is a 10-items self-report scale where the participant's nurses were asked to rate their feelings and thoughts throughout the previous month on a five-point scale ranging from never (0) to very often (4). As a result, each participant's score may be anywhere from 0 to 40. Higher stress levels are indicated by higher scores. Low stress is indicated by a PSS score of 0 to 13, moderate stress is indicated by a PSS score of 14 to 26, and severe stress is indicated by a PSS score of 27 or above. Reverse scoring was

utilized on four of the items (items 4, 5, 7, and 8). The PSS-10 has an internal consistency of 0.78.15, which was discovered by correlational analysis with measures of anxiety, sadness, helplessness, and disease activity (Chaaya, et al, 2010).

### **Tool III: The Brief COPE Inventory (BCOPE):**

**BCOPE** was adopted from (Carver, 1997 & Baumstarck, et al., 2017) it is a multidimensional scale with fourteen subscales that assess different aspects of coping. This quiz scale has 28 questions that cover 14 different coping mechanisms. Successful coping strategies were assessed using seven subscales (2 questions each) with a total of 14 items, including active coping, use of instrumental support, venting, positive reframing, planning, humor, acceptance and religion,. While self-distraction, denial, behavioral disengagement, and self-blame were among the other seven subscales that looked at inadequate coping techniques. Respondents were asked to rate each item on a four-point Likert scale ranging from 1 (I haven't done it at all) to 4 (I have done it a lot) (I have been doing this a lot). Each subscale's total score was obtained, and higher total subscale scores reflected greater perceived usage of coping behavior. In a previous study, Cronbach's alpha values among BCOPE domains were 0.90.

### **Methods:**

The study was conducted throughout three main phases (preparatory phase, implementation phase and evaluation phase).

#### **Preparatory phase:-**

- 1- An official Permission was taken from the Sohag university hospital authority to facilitate the implementation of the study after explaining the aim of the study.
- 2- Approval was obtained from the local ethical committee and the study followed the ethical principles in the clinical research.
- 3- **Content validity:** The tools were tested for content related validity by the jury of 5 specialists in the field of Critical Care Nursing and Psychiatric Nursing and Mental Health from Assiut and Sohag University, and no modifications were done.
- 4- **A pilot study** was carried out on 10% of the nurse (5 nurses) to test the clarity and applicability of the tools. The tool was applicable and there wasn't any modification. The pilot study subjects not included in the study.
- 5- **Ethical considerations:** Each nurse was informed about the aim of the study in the description of the questionnaire before starting. Nurses were informed that participation in the study is voluntary and that they had the right to withdraw from the study at any time before completing the questionnaire with no consequences, without

giving any reason and that their responses would be held confidentially. The Anonymity of the collected data has been ensured for the participants'.

- 6- **Data collection:** took approximately six months from March 2021 to August 2021. Where A total of 51 critical care nurses from Sohag University Hospital's critical care units (general ICU, CCU, and trauma ICU) were recruited to participate in the study via WhatsApp groups, which contained information about the study's purpose and how long the questionnaire would take to complete (20 min). The online questionnaire was written in English and then translated into Arabic using Google translation so that each statement could be easily understood. Then questionnaire was sent using a Google Form [https://docs.google.com/forms/d/1-aKRcmQFEuQzdpvzIQaozhPRiu8kwkOH2gdFGZ9Ljyg/viewform?edit\\_requested=true](https://docs.google.com/forms/d/1-aKRcmQFEuQzdpvzIQaozhPRiu8kwkOH2gdFGZ9Ljyg/viewform?edit_requested=true). All of the replies of the nurses who accepted to respond to questionnaire were compiled into an online spreadsheet to assess burnout levels, stress levels and coping strategies.

#### **7- Development of the psychological educational program:**

The educational program was developed by the researcher after reviewing the relevant literature. The program was adopted through the following steps:

- Stating the program general and specific objectives.
- Planning the program (arrange the contents of the program into four teaching sessions in addition to the preliminary one).
- Power point presentations and booklets were developed in the Arabic language by the researcher. And using group discussion in addition to achieving the program aims.
- The total sample was divided into 3 groups for a better understanding of the contents.

#### **Implementation phase:-**

- All the nurses were met before the start of the shift or during the break time in different shifts.
- Assessment of Burnout level, stress level and effective coping strategies used by the nurses was done twice:
  - a. First time at the beginning of the study as pretest assessment and as base line data for comparison with the post- test data.
  - b. The second time was after the program implementation to assess the effect of the program on nurses' level of Burnout, stress and use of effective coping strategies.

#### **Implementation of the program:**

The program was delivered for the groups in four sessions in addition to the preliminary one as follows:

- 1- Preliminary session: in this session the researcher explain to the participating nurses the objectives, contents and methods of evaluation of the educational program.
  - 2- Session (1): it covers an introduction to job burnout, identifies the warning signs that warn us of reaching that critical stage, the stages of job burnout and Occupational Burnout Treatment.
  - 3- Session (2): it covers Identifies psychological adaptation, its domains and components, and the factors that affect adaptation.
  - 4- Session (3): it covers how to solve the problems nurses encounter during their work in critical care units.
- Group discussion was encouraged during the session to stimulate understanding and reach the target objectives of the educational program.

**Evaluation phase:**

Evaluation of the program was carried out immediately after its implementation using pretest study tools to evaluate the effect of the program on the burnout and stress levels for the critical care nurses.

**Statistical analysis:**

- Collected data were statistically analyzed using (SPSS, version 25). Descriptive statistics (number, percent, and mean and stander deviation) were used to describe the variables.
- Chi-square test was used to compare qualitative variables between before and after groups.
- A two-tailed  $P > 0.05$  was considered statistically non-significant,  $p < 0.05$  significant,  $P < 0.01$  moderate significant while  $P < 0.001$  highly significant.

**Results****Table (1): Demographic characteristics of the study participants (n=51).**

	No	%
<b>Age group</b>		
Less than 25 years	23	45.1
From 25-30 years	20	39.2
More than 30 years	8	15.7
<b>Mean <math>\pm</math>SD(range)</b>	<b>27.75<math>\pm</math>5.08(21- 44)</b>	
<b>Gender</b>		
Male	23	45.1
Female	28	54.9
<b>Education Level</b>		
Bachelor of nursing	17	33.3
Technical institute of nursing	22	43.2
Nursing Diploma	12	23.5
<b>Marital Status</b>		
Single	19	37.3
Married	30	58.8
divorced/ widow	2	3.9

**Table (2): Work-related characteristics of the study participants (n=51).**

	No	%
<b>Type of ICU</b>		
Pediatric	13	25.5
Obstetric	7	13.7
General ICU	23	45.1
Cardiac	8	15.7
<b>Years of ICU experience</b>		
Less than 3 years	18	35.3
From 3-5 years	18	35.3
More than 5 years	15	29.4
<b>Expeirience years</b>		
Less than 5 years	36	70.6
From 5-10 years	11	21.6
More than 10 years	4	7.8

**Table (3): Distribution of Maslach Burnout Inventory of intensive care unit nurses before and after the educational program (n=51).**

	Pre		Post		P. value
	No	%	No	%	
<b>Emotional Exhaustion</b>					
Low	6	11.8	24	47.1	<0.001**
Moderate	9	17.6	12	23.5	
High	36	70.6	15	29.4	
<b>Mean±SD</b>	<b>32.29±11.36</b>		<b>23.69±14.72</b>		0.001**
<b>Depersonalization</b>					
Low	8	15.7	15	29.4	0.041*
Moderate	22	43.1	26	51.0	
High	21	41.2	10	19.6	
<b>Mean±SD</b>	<b>12.73±6.19</b>		<b>10.61±6.51</b>		0.096
<b>Personal accomplishment</b>					
Low	35	68.6	48	94.1	0.004**
Moderate	5	9.8	1	2.0	
High	11	21.6	2	3.9	
<b>Mean±SD</b>	<b>37.35±9.53</b>		<b>43.37±5.48</b>		<0.001**

- Chi square test for qualitative data between the two groups or more.

- Independent T-test quantitative data between the two groups

- \*Significant level at P value < 0.05, \*\*level at P value < 0.01

**Table (4): Distribution of perceived stress level of intensive care unit nurses before and after the educational program (n=51).**

	Pre		Post		P. value
	No	%	No	%	
<b>Perceived Stress Level</b>					
Low stress	8	15.7	37	72.5	<0.001**
Moderate stress	37	72.5	9	17.6	
Severe stress	6	11.8	5	9.8	
<b>Mean±SD</b>	<b>19.06±5.21</b>		<b>11.06±9.44</b>		<0.001**

- Chi square test for qualitative data between the two groups or more.

- Independent T-test quantitative data between the two groups

- \*Significant level at P value < 0.05, \*\*level at P value < 0.01

**Table (5): Comparison between Influence of different coping behaviors among intensive care unit nurses before and after the educational program (n=51)**

	Pre	Post	Statistical test	P. value
	Mean±SD	Mean±SD		
Self-distraction	4.92±1.7	6.49±1.85	-4.467	<0.001**
Denial	4.14±1.7	3.27±1.55	2.680	0.009**
Substance use	2.33±1.21	2±0	1.966	0.052
Behavioral disengagement	3.78±1.8	3.08±1.2	2.329	0.022*
Active coping	5.75±1.55	6.35±1.68	-1.899	0.060
Use of instrumental support	5.76±1.83	7.08±1.2	-4.292	<0.001**
Use of emotional support	5±1.72	6.59±1.94	-4.373	<0.001**
Positive reframing	5.71±1.75	6.57±1.9	-2.387	0.019*
Planning	5.8±1.54	6.53±1.89	-2.127	0.036*
Venting	4.51±1.96	4.75±1.55	-0.672	0.503
Humor	4.1±1.76	3.49±1.85	1.702	0.092
Acceptance	5.98±1.78	6.69±1.86	-1.956	0.053
Religion	6.88±1.56	7.73±0.63	-3.580	0.001**
Self-blame	5.33±1.88	3.73±1.71	4.514	<0.001**

- Independent T-test quantitative data between the two groups

\*Significant level at P value < 0.05,

\*\*Significant level at P value < 0.01

**Table (6): Correlation Co-efficient between Maslach Burnout Inventory of intensive care unit nurses before and after the educational program with Perceived Stress and coping behaviors (n=51)**

Correlations		Before education			After education		
		Emotional Exhaustion	Depersonalization	Personal accomplishment	Emotional Exhaustion	Depersonalization	Personal accomplishment
Perceived Stress Scale	R	0.515	0.464	-0.215	0.855	0.808	-0.353
	P	0.000**	0.001**	0.130	0.000**	0.000**	0.011*
<b>Coping behaviors</b> subscale: Self-distraction	R	-0.016	-0.075	0.254	-0.727	-0.680	-0.139
	P	0.909	0.603	0.072	0.000**	0.000**	0.331
Denial	R	0.250	0.183	0.156	0.176	0.070	-0.410
	P	0.077	0.200	0.273	0.218	0.624	0.003**
Substance use	R	0.080	0.082	0.090	-	-	-
	P	0.577	0.568	0.530	-	-	-
Behavioral disengagement	R	0.397	0.317	-0.072	0.190	0.637	-0.126
	P	0.004**	0.023*	0.614	0.182	0.000**	0.377
Active coping	r	0.024	0.011	0.578	-0.677	-0.768	-0.088
	P	0.869	0.937	0.000**	0.000**	0.000**	0.538
Use of instrumental support	r	0.028	-0.027	0.381	-0.631	-0.468	-0.090
	P	0.843	0.851	0.006**	0.000**	0.001**	0.531
Positive reframing	r	0.088	-0.107	0.554	-0.574	-0.604	0.258
	P	0.539	0.453	0.000**	0.000**	0.000**	0.068
Planning	r	0.114	0.066	0.514	-0.244	-0.184	-0.008
	P	0.424	0.647	0.000**	0.084	0.196	0.956
Use of emotional support	r	0.289	0.090	0.324	-0.731	-0.687	-0.025
	P	0.040*	0.529	0.020*	0.000**	0.000**	0.863
Venting	r	0.214	0.078	0.140	0.551	0.325	-0.571
	P	0.132	0.589	0.328	0.000**	0.020*	0.000**
Humor	r	0.174	0.203	0.146	0.516	0.285	-0.129
	P	0.223	0.153	0.307	0.000**	0.042*	0.367
Acceptance	r	0.127	-0.049	0.547	-0.673	-0.634	-0.179
	P	0.376	0.731	0.000**	0.000**	0.000**	0.210
Religion	r	0.217	0.073	0.725	-0.444	-0.017	0.237
	P	0.127	0.609	0.000**	0.001**	0.906	0.094
Self-blame	r	0.258	0.118	0.293	0.545	0.163	-0.644
	P	0.068	0.410	0.037*	0.000**	0.255	0.000**

\*Statistically Significant Correlations At P. value &lt;0.05

\*\*Statistically Significant Correlations At P. value &lt;0.01

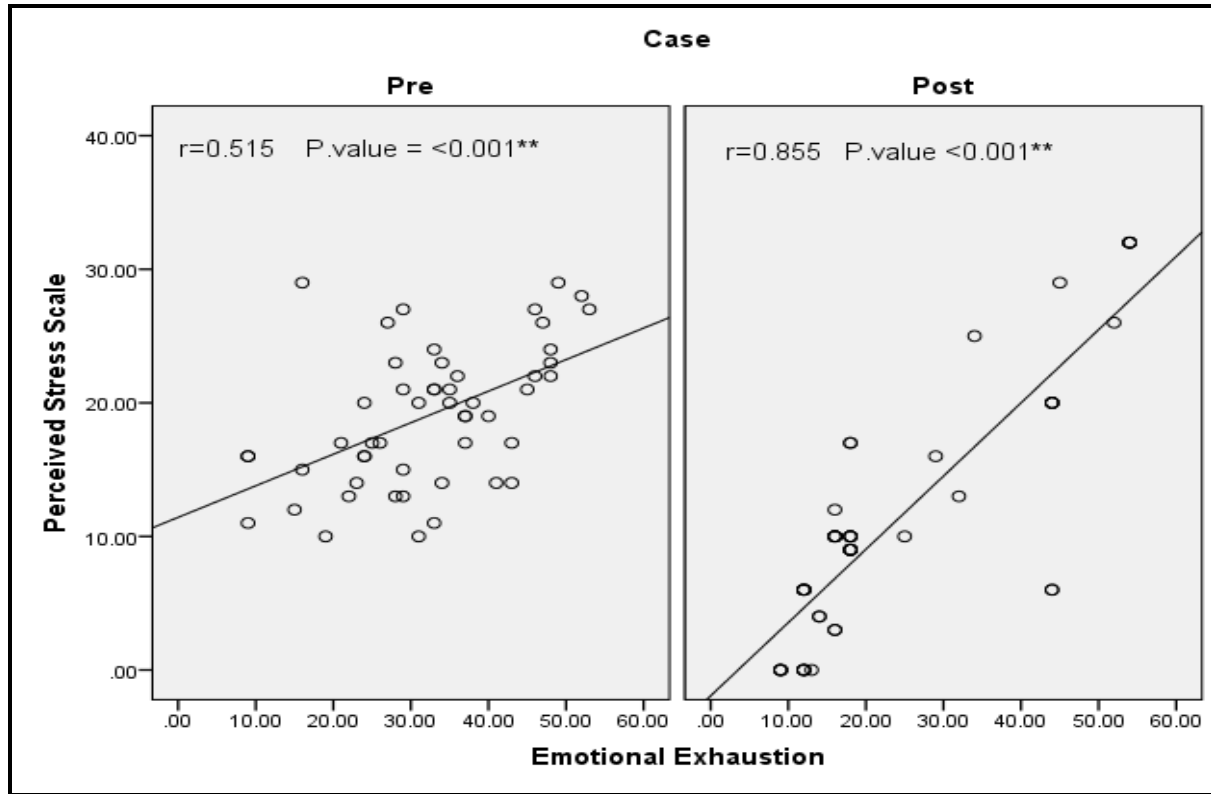


Figure (1): Correlation between perceived stress scale and emotional exhaustion

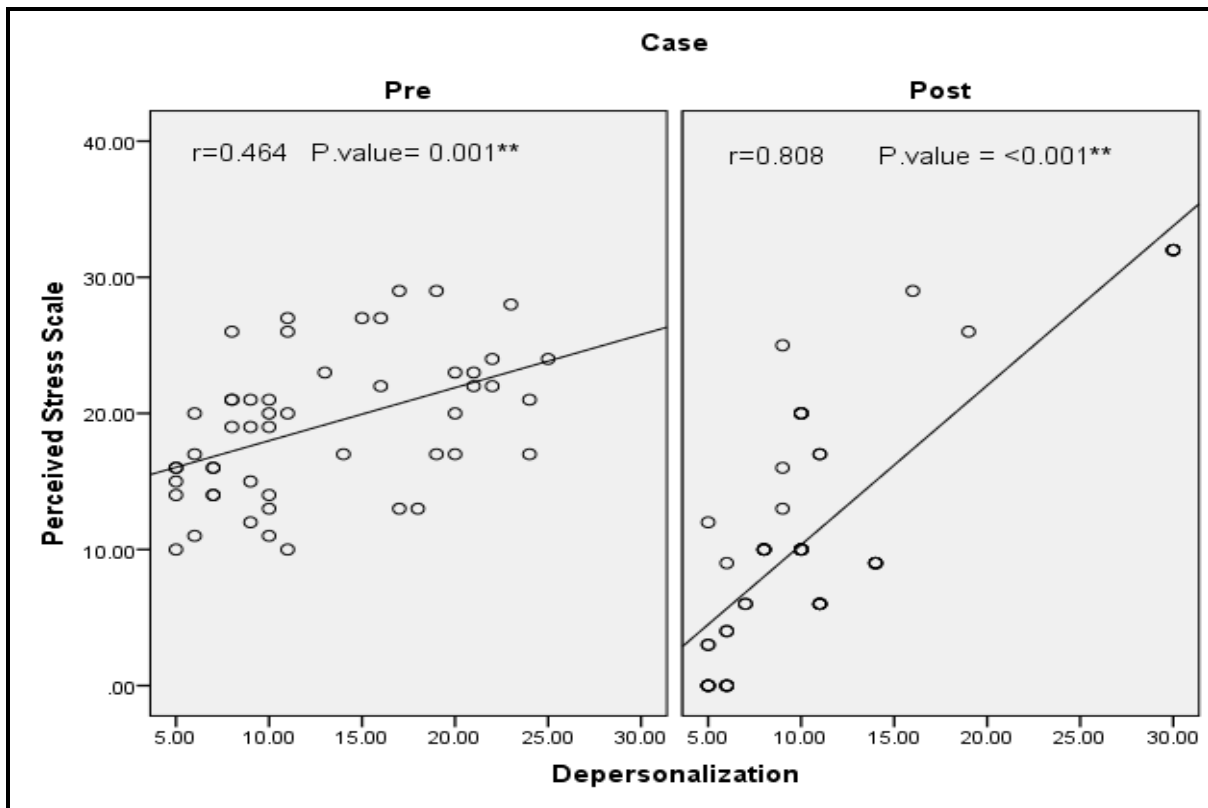


Figure (2): Correlation between perceived stress scale and depersonalization



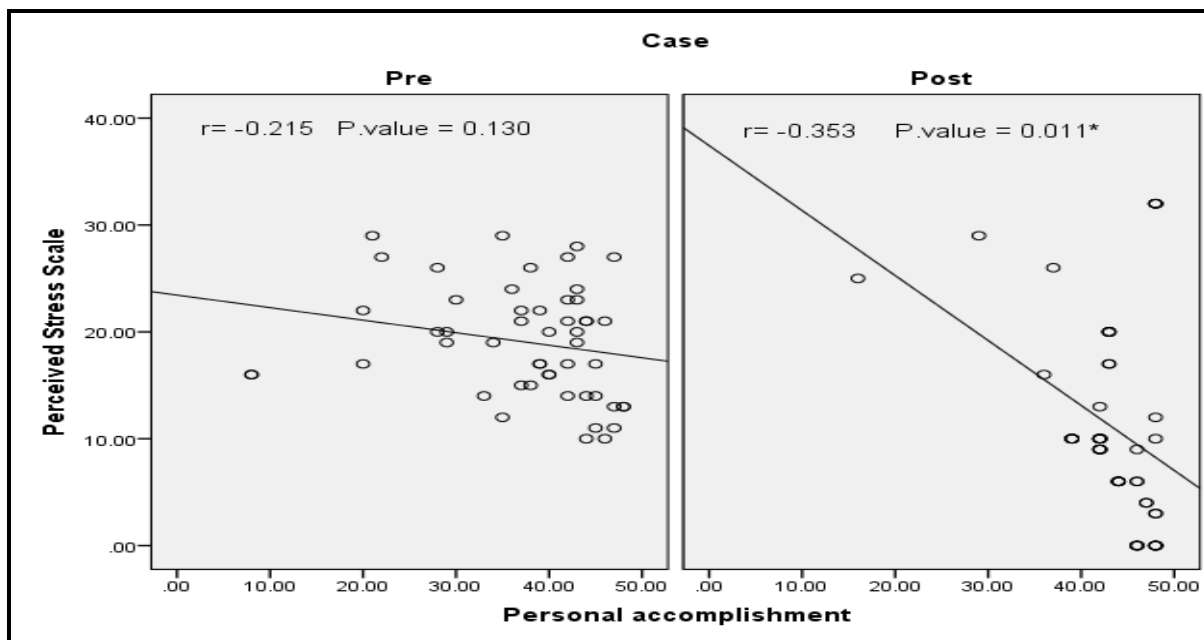


Figure (3): Correlation between perceived stress scale and personal accomplishment

Table (7): Comparison between Perceived Stress Scale among intensive care unit nurses with personal data before and after intervention (n=51)

	Perceived Stress Scale				
	N	Before		After	
		Mean ±SD	Statistical test	Mean ±SD	Statistical test
<b>Age group</b>					
Less than 25 year	23	19.91±5.16	F=0.602 P=0.552	12.87±8.36	F=3.248 P=0.048*
From 25-30 year	20	18.55±4.49		7.2±7.47	
More than 30 years	8	17.88±7.1		15.5±13.76	
<b>Gender</b>					
Male	23	19.13±4.74	T=0.088 P=0.930	10.39±8.84	T=-0.454 P=0.652
Female	28	19±5.64		11.61±10.03	
<b>Educational Level</b>					
Bachelor of nursing	17	19.24±4.88	F=0.087 P=0.917	11.76±8.80	F=0.087 P=0.917
technical institute	22	19.23±4.75		7.09±3.77	
Nursing Diploma	12	18.50±6.71		17.33±13.79	
<b>Marital Stats</b>					
Single	19	19.32±4.74	F=0.203 P=0.817	12.63±9.8	F=0.828 P=0.443
Married	30	18.77±5.69		9.73±8.44	
divorced/ widow	2	21±0		16±22.63	
<b>Type of ICU</b>					
Pediatric	13	18.77±6.02	F=1.083 P=0.365	7.92±5.5	F=0.871 P=0.463
obstetric	7	17.71±3.04		11.43±14.55	
General ICU	23	18.61±5.02		11.48±7.37	
Cardiac	8	22±5.66		14.63±14.11	
<b>Years of ICU experience</b>					
Less than 5 years	36	19.28±5.31	F=2.036 P=0.142	10.42±8.14	F=1.185 P=0.315
From 5-10 years	11	20.09±4.83		10.64±11.83	
More than 10 years	4	14.25±3.1		18±13.27	
<b>Experience years</b>					
Less than 3 years	18	18.94±6.02	F=1.419 P=0.252	11.83±9.24	F=0.371 P=0.692
From 3-5 years	18	20.5±4.66		9.5±9.13	
More than 5 years	15	17.47±4.58		12±10.41	

- Independent T-test quantitative data between the two groups

- One-way Anova T-test quantitative data between the Three groups or more \*Significant level at P value < 0.05,

**Table (8): Influence of different coping behaviors on perceived stress before education**

Predictor variables	B	Std. Error	Beta	t	P value	95.0% Confidence Interval for B	
						Lower Bound	Upper Bound
Self-distraction	-0.862	0.621	-0.281	-1.388	0.174	-2.121	0.397
Denial	-0.259	0.557	-0.085	-0.466	0.644	-1.388	0.869
Substance use	-1.472	0.676	-0.342	-2.176	<b>0.036*</b>	-2.843	-0.100
Behavioral disengagement	0.889	0.499	0.308	1.781	0.083	-0.124	1.901
Active coping	-0.171	0.657	-0.051	-0.261	0.796	-1.504	1.161
Use of instrumental support	-0.527	0.565	-0.185	-0.932	0.357	-1.673	0.619
Positive reframing	-0.364	0.625	-0.122	-0.582	0.564	-1.630	0.903
Planning	0.708	0.743	0.209	0.952	0.347	-0.800	2.216
Use of emotional support	0.243	0.479	0.080	0.508	0.615	-0.728	1.214
Venting	1.084	0.610	0.409	1.777	0.084	-0.153	2.322
Humor	0.954	0.555	0.322	1.719	0.094	-0.171	2.078
Acceptance	0.223	0.666	0.077	0.335	0.739	-1.128	1.575
Religion	-0.660	0.766	-0.197	-0.861	0.395	-2.213	0.894
Self-blame	0.606	0.592	0.219	1.024	0.313	-0.594	1.806

Perceived stress was the dependent variable in the multiple linear regressions.  $\beta$  is the unstandardized coefficients; SE-b is the Standard error.  $R^2=0.703$ ; Adjusted  $R^2=0.297$ .

**Table (9): Influence of different coping behaviors on perceived stress after education**

Predictor variables	B	Std. Error	Beta	t	P value	95% CI	
						Lower	Upper
Self-distraction	0.508	0.624	0.099	0.814	0.421	-0.756	1.772
Denial	0.615	0.394	0.101	1.562	0.127	-0.183	1.413
Behavioral disengagement	-0.009	0.625	-0.001	-0.015	0.988	-1.277	1.258
Active coping	-1.985	0.932	-0.354	-2.131	<b>0.040*</b>	-3.873	-0.097
Use of instrumental support	0.071	0.899	0.009	0.079	0.938	-1.751	1.893
Positive reframing	-1.521	0.522	-0.306	-2.914	<b>0.006**</b>	-2.578	-0.463
Planning	0.458	0.395	0.092	1.161	0.253	-0.341	1.258
Use of emotional support	-2.113	0.604	-0.434	-3.499	<b>0.001**</b>	-3.337	-0.889
Venting	0.227	0.586	0.037	0.387	0.701	-0.960	1.413
Humor	-0.075	0.271	-0.015	-0.276	0.784	-0.624	0.474
Acceptance	-0.010	0.676	-0.002	-0.015	0.988	-1.380	1.359
Religion	2.832	1.571	0.191	1.802	0.080	-0.352	6.017
Self-blame	2.132	0.618	0.386	3.451	<b>0.001**</b>	0.881	3.384

Perceived stress was the dependent variable in the multiple linear regression.  $\beta$  is the unstandardized coefficients; SE-b is the Standard error.  $R^2=0.967$ ; Adjusted  $R^2=0.913$ .

**Table (1):** Shows that, concerning age the highest number of nurses were less than 25 years and the mean age  $27.75 \pm 5.08$ . Regarding gender, it revealed that about 54.9% of the studied sample was female, and 43.2% are graduates from technical institutes, and more than half of them were married (58.8%).

**Table (2):** Shows that, concerning the type of intensive care unit 45.1% of nurses work in General ICU, and related to years of ICU experience 35.3% were less than 3 years and the other 35.3% were from 3-5 years of ICU experience.

**Table (3):** Present that there was a statistically significant difference in emotional exhaustion, depersonalization and Personal accomplishment before and after the educational program.

**Table (4):** Shows that more than half of the studied nurses had a moderate level of stress before program application, while the highest number had low stress levels after program application with the significant level at P-value < 0.01.

**Table (5):** Demonstrate that there was a statistically significant difference in all coping behavior scale as

self-distraction, denial, behavioral disengagement, use of instrumental support, use of emotional support, positive reframing, planning, religion and self-blame, while showing no statistically significant difference in other coping behaviors as substance use, active coping, venting, humor and acceptance.

**Table (6):** This table presents that there was statically significant differences in Perceived Stress Scale and in all Maslach Burnout Inventory subscales before and after intervention except in personal accomplishment items before intervention. There were statically significant differences between the Maslach Burnout Inventory subscale as emotional exhaustion & depersonalization and in self-distraction after intervention personal accomplishment and denial after the intervention. There were statically significant differences emotional exhaustion & depersonalization and behavioral disengagement before intervention and in depersonalization after the intervention. There were statically significant differences in emotional exhaustion & depersonalization and active coping after intervention and personal accomplishment before intervention the same in the use of instrumental support, positive reframing and acceptance. There were statically significant differences in emotional exhaustion, depersonalization and personal accomplishment and venting after the intervention. There were statically significant differences in emotional exhaustion, depersonalization and humor after intervention. There were statically significant differences in personal accomplishment before intervention and emotional exhaustion after intervention and religion and self-blame

**Figure (1):** This figure shows positive correlation between the perceived stress scale and emotional exhaustion among critical care nurses before and after the educational intervention.

**Figure (2):** This figure shows positive correlation between the perceived stress scale and depersonalization among critical care nurses before and after the educational intervention.

**Figure (3):** This figure shows negative correlation between the perceived stress scale and personal accomplishment after intervention and there is no significant relationship between the perceived stress scale and personal accomplishment before educational intervention

**Table (7):** This table shows the comparison between the Perceived Stress Scale among intensive care unit nurses with personal data before and after the educational intervention, there were significant differences between the perceived Stress Scale and age of nurses and their educational Levels p-value

( $P=0.048$  &  $P=0.020$  respectively\*) after the intervention.

**Tale (8):** This table presents that there was no statically significant differences in the influence of different coping behaviors on perceived stress before education except in substance use p-value =0.036

**Table (9):** This table shows the influence of different coping behaviors on perceived stress after education there are statically significant differences in active coping, positive reframing and use of emotional support (p-value 0.040\*, 0.006\*\* and 0.001\*\* respectively)

### Discussion:

Burnout is a long-term reaction to job-related chronic emotional and interpersonal stress that is often the result of putting in too much effort at work while getting too little rest. Burnout is more likely in the healthcare personnel who work in a demanding medical environment, such as an intensive care unit (ICU). Nurses who work in intensive care units are more stressed than those who work in other units. Burnout in healthcare personnel can harm their well-being and the quality of professional treatment they give, which can jeopardize patient safety (Maslach, & Leiter, 2016)

In terms of gender, the current study found that over half of the nurses were female and under the age of 25. This is consistent with Chitura, & Chitura, (2014) who evaluated "Burnout Syndrome in Intensive Care Unit Nurses in Zimbabwe" who reported that the bulk of Participants were female. Also Karanikola, et al (2012) on "Burnout Syndrome Indices in Greek Intensive Care Nursing Personnel" indicated that the majority of the participants were female. While their participants' mean age was higher than that of the current study.

Furthermore, more than two-thirds of the nurses in the current study had a technical nursing degree, and over half of them had fewer than five years of experience in critical care units, which is identical to the results of Zhang, et al (2014) evaluated "Job burnout among critical care nurses from 14 adult intensive care units" and found that the majority of nurses have fewer than five years of experience in critical care units.

In terms of burnout prevalence among intensive care unit nurses before and after the intervention, the current study discovered a significant reduction in the levels of emotional exhaustion, depersonalization, and personal achievement after the intervention compared to before the intervention.

According to the researchers, the highest level of Burnout dimension among critical care nurses before the educational program was connected to their younger age and less experience in dealing with work

demands, stressful scenarios, and ethical difficulties frequently. When these stressors are paired with a lack of staffing, resources, and competence to deal with them, the results can be disastrous. However, Burnout reduction after education is connected to an education program that covers a variety of topics around burnout, including "definition, indications, and likely causes, self-care techniques include breathing exercises, communication skills training, and stress management.

The finding in the current study is in the same line as (Quenot et al. 2012). Who conduct a study on "Suffering among carers working in critical care can be reduced by an intensive communication strategy on end-of-life practices" they reported that reduced risk of severe burnout syndrome by half after implementing the communication strategy. Also, Atallah et al (2019). In study titled "Burning out physical and emotional fatigue: Evaluating the effects of a program aimed at reducing burnout among mental health nurses". reported the positive effects of intervention programs in reducing burnout, in addition, Ahmadi., et al. (2014) that conducted a study titled (Correlation between workplace and occupational burnout syndrome in nurses) reported that nurses who worked in critical care units were more exposed to burnout, which due to work load environment.

Findings in the current study are differ from the findings of Relyea.,(2020), who observed that there was no significant difference in pre and post scores emotional exhaustion, depersonalization, and personal achievement among the group of participants in a study named "Reduce Burnout in the Critical Care Setting." Also, Merlani., et al., 2012, In the study about "Burnout in ICU Caregivers" reported that nurses had decreased risk of high burnout. In addition Alvares et al., (2020) observed in their study about (Burnout syndrome among healthcare professionals in intensive care units" that most the nurses reported low levels for each dimension of burnout. According to emotional exhaustion, the bulk of critical care nurses reported a high level of emotional exhaustion before the educational program which is consistent with Chitura, & Chitura, (2014) who evaluated "Burnout Syndrome in Intensive Care Unit Nurses in Zimbabwe". Also, Hannigan, et al 2000 reported that half of the nurses reported a high level of emotional exhaustion.

In the term of level of depersonalization, the present study shows that near half of critical care nurses reported a moderate level of depersonalization, which is not identical to Alameddine., et al, 2012 in the study titled "The retention of health human resources in primary healthcare canters in Lebanon" claimed

that majority of nurses reported a high level of depersonalization.

In terms of perceived stress levels among intensive care unit nurses, there was moderate stress before the education and low stress following education. According to the study, a significant stress reduction was linked to non-traditional mindfulness training, which showed promise in providing nurses with crucial coping skills to handle stress, Which is in line with Lin et al (2019) who conducted a study about "The Effects of a Modified Mindfulness-Based Stress Reduction Program for Nurses" claimed that improvement in perceived stress immediately after intervention and at 3-month follow-up.

Alharbi & Alshehry 2019 investigated ICU nurses' perceptions of stress and coping mechanisms. The bulk of nurses surveyed said they were stressed to a moderate degree. Administrative difficulties, such as staffing shortages, insufficient assistance from nursing supervisors, low pay, and excessive expectations, have also been identified as stressors among ICU nurses.

Regarding coping behaviour's among intensive care unit nurses present study reveals that intensive care unit nurses after education program focus on some coping behaviour to overcome their stress and burnout with significant differences between both pre and post education especially self-distraction, active coping, use of instrumental support, use of emotional support, positive reframing, acceptance, planning and religion but before education they commonly self-blamed. According to the researchers, nurse self-blame may be linked to the death of some patients who stayed in the ICU for prolonged periods, building a bond with the ICU nurse. In the majority of situations, family members will raise questions and may even accuse the nurses of not doing enough.

From the researcher's point of view, the significant differences in all coping behavior scales due to the interest of ICU nurses in teaching them coping mechanisms to alleviate their level of burnout and stress which was discovered during pre-education interviews, and they believe that their well-being is of critical importance not only to the quality of care provided to critically ill patients, but also to maintain their physical and mental health.

Pejuskovic, et al. (2011) confirmed that coping strategies are very important in the development of burnout, e.g. escape and avoidance were related to depersonalization and lack of personal accomplishment, while self-controlled led to higher personal accomplishment and lower depersonalization. Bayuo., & Agbenorku., 2017 who study conducted on coping strategies among nurses in the Burn Intensive Care Unit found ICU

nurses displayed more appropriate coping strategies than unsuccessful ones.

Regarding the Influence of different coping behaviors on perceived stress before intervention there was no statically significant differences in the influence of different coping behaviors on perceived stress before intervention except in substance use  $p=0.036$ . While, **Alharbi, & Alshehry, 2019** Who Study about the perceived stress and coping strategies among ICU nurses in government tertiary hospitals in Saudi Arabia found that behavioral detachment, acceptance, as well as self-blame were major factors influencing stress perception. The PSS-10 score increased by one point in behavioral detachment and one point in self-blame, respectively. Furthermore, a one-point increase in the acceptance score was associated with a one-point drop in the PSS-10 score. The same author also discovered that behavioral detachment and self-blame had an impact on stress levels. This suggests that using these two coping mechanisms more frequently leads to a higher degree of stress.

Regarding perceived stress scale among intensive care unit nurses personal data shows that there were significant differences between the perceived Stress Scale and the age of nurses and their educational level  $p$ -value ( $P=0.048$  &  $P=0.020$  respectively) after the intervention. Regarding the influence of different coping behaviour's on perceived stress after the educational program, there statically significant differences in active coping, positive reframing and use of emotional support ( $p$ -value 0.040, 0.006 and 0.001 respectively). This result was in accordance with **Gracia-Gracia et al., 2017** presented the results of a correlation between burnout and the ability of mindfulness self-compassion in nursing in intensive care units. The results of this study show that the level of burnout is inversely related to their level of self-compassion

### Conclusion:

Based on the results of the current study, it can be concluded the application of such a psychological program has a positive effect on reducing the level of burnout, and stress among critical care nurses and helping to assess nurses to use effective coping strategies.

### Recommendations:

- Stress management techniques workshops and training programs should be held periodically for critical care nurses.
- Training programs about burnout syndrome its causes, risk factor, effect on critical care nurses' performance and its overcoming techniques should be carried usually.

- Further studies are recommended to include information about the long follow-up of these nurses and carried out the research on a large sample size and different governmental hospital for generalization.

### Limitation of the study:

- Limitation of this study were low sample size in ICU, lack of long-term follow-up, also some of the nurses that attended the educational program appeared distracted, and anxious to get home. This is likely due to the time of the training after their work shift.

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